What technology is best for wavelength division multiplexing

Article Overview

Wavelength Division Multiplexing (WDM) uses multiple laser-generated optical signals at distinct wavelengths, combined and separated by optical multiplexers and demultiplexers, to transmit multiple data streams over a single fiber.

Core Principles

WDM operates by exploiting the property of light that different wavelengths (colors) can travel through the same optical fiber independently without interference. Each data stream is converted into pulses of laser light and assigned a unique wavelength, allowing multiple channels to coexist in a single fiber simultaneously . This is analogous to assigning different radio frequencies to separate radio stations.

Key Components

- Multiplexer (MUX): At the transmitter, a MUX combines multiple optical signals of different wavelengths into a single fiber. Technologies used include thin-film filters and arrayed waveguide gratings (AWGs), which precisely align and combine wavelengths with minimal insertion loss .

- Demultiplexer (DEMUX): At the receiver, a DEMUX separates the combined wavelengths back into individual channels for processing. Optical filters or AWGs ar...

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How To Select Wavelength Division Multiplexers Image Credit: Microwave Photonic Systems Inc. Wavelength division multiplexers

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